REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application. No claims have been canceled. Claims 1-57 are pending, of which claims 20, and 37-38 have been amended to overcome a rejection under 35 USC § 101.

Replacement Drawings

Applicant submits herewith a complete replacement set of formal drawings (sheets 1-4) to comply with the examiners objection.

35 U.S.C. §101 Claim Rejections

Claims 20, and 37-38 are rejected under 35 USC § 101 as being directed to non-statutory subject matter, specifically non-statutory "computer readable medium" as noted by the Office (*Office Action*, p. 3). The Office argues that lines 23 page 31 to line 8 page 32 of the subject application defines the claimed computer readable medium "as including non-statutory media such as carrier wave, RF, infrared." The Office further argues that the non-statutory media is "incapable of being touched or perceived absent the statutory medium through which they are conveyed." Applicant respectfully disagrees with the Office's argument. Nevertheless, in the interest of advancing the prosecution of these claims, Applicant has amended claims 20, and 37-38 to recite "A tangible computer-readable medium..." As such, claims 20, and 37-38 are allowable. Applicant respectfully requests that the 35 USC § 101 rejection be withdrawn.

35 U.S.C. §103 Claim Rejections

A. Claims 1-13, 15, 20-32, 34, 37-43, 46-51, and 54 are rejected under 35 USC § 103(a) for obviousness over US Patent No. 5,799,173 to Gossler et al. (hereinafter, "Gossler"), in view of US Patent No. 6.728,748 to Mangipudi et al. (hereinafter, "Mangipudi") (*Office Action*, p. 2).

B. Claims 14, 16-19, 33, 35-36, 44-45, 52-53, and 55-57 are rejected under 35 USC § 103(a) for obviousness over Gossler in view of Mangipudi and further in view of US Patent No. 6,321,263 to Luzzi et al. (hereinafter, "Luzzi") (*Office Action*, p. 6). Applicant respectfully traverses the rejections.

Applicant submits that the Office has failed to establish a *prima facie* case of obviousness in rejecting claims 1-57, and Applicant respectfully traverses the rejections.

Claim 1 recites a method comprising:

dynamically determining present members of a load-balancing cluster which includes nodes and a node manager; and

monitoring application-layer availability of one or more members of the cluster, the monitoring being performed by one or more clients outside of the cluster which are communicatively linked to the node manager in the cluster, such that the monitoring is from a client perspective to detect an error that may impact the application-layer availability as it appears to the one or more clients from outside of the cluster.

Gossler and/or Mangipudi do not teach or suggest the combination of feature(s) recited in claim 1. For example, Gossler and/or Mangipudi do not teach or suggest "dynamically determining present members of a load-balancing cluster

which includes nodes and a node manager" and "monitoring application-layer availability of one or more members of the cluster, the monitoring being performed by one or more clients outside of the cluster which are communicatively linked to the node manager in the cluster, such that the monitoring is from a client perspective to detect an error that may impact the application-layer availability as it appears to the one or more clients from outside of the cluster", as recited in claim 1.

To the contrary, Gossler pertains generally to dynamic workload balancing. Gossler describes a technology for dynamically controlling the number of servers in a transaction system comprising at least one service unit for processing service requests (*Gossler*, Abstract). Each service unit comprises a queue for receiving and queuing the incoming service requests and a plurality of servers for executing the service requests (*Gossler*, col. 2 lines 55-60). A queuing monitor monitors and controls the servers for each one of the service units of the service point (*Gossler*, col. 3 lines 10 – 21). Further, the queuing monitor provides a dynamic workload balancing method to employ an optimized number of servers for each service unit to be monitored (*Gossler*, col. 4 lines 41-43).

The Office cites Gossler for teaching a method comprising determining present members of a load-balancing cluster. The Office cited col. 4 lines 40-43 of Gossler, which is reproduced here for convenience:

> **As to claim 1**, Gossler teaches a method comprising determining present members (servers, line 42 column 4) of a load-balancing cluster (dynamic workload balancing method provided by the queuing monitor 85 or any other queuing monitor order to employ an optimized number of servers for each service unit to be monitored, lines 40-43 column 4);

Applicant disagrees because Gossler neither teaches nor suggests there determining present members of a load-balanced cluster. Further, Gossler is only directed to a queuing monitor using a dynamic workload balancing method to employ an optimized number of servers for each service unit to be monitored. However, the Applicant's claims recite "dynamically determining present members of a load-balancing cluster which includes nodes and a node manager" and "monitoring application-layer availability of one or more members of the cluster, the monitoring being performed by one or more clients outside of the cluster which are communicatively linked to the node manager in the cluster, such that the monitoring is from a client perspective to detect an error that may impact the application-layer availability as it appears to the one or more clients from outside of the cluster."

In addition to the foregoing, the Office recognizes that Gossler fails to disclose "dynamically determining present members of a load-balancing cluster which includes nodes and a node manager" and "monitoring application-layer availability of one or more members of the cluster, the monitoring being performed by one or more clients outside of the cluster which are communicatively linked to the node manager in the cluster, such that the monitoring is from a client perspective to detect an error that may impact the application-layer availability as it appears to the one or more clients from outside of the cluster." The Office then relies on Mangipudi as curing the deficiencies of Gossler (*Office Action*, p. 4).

Mangipudi pertains generally to a method and apparatus for policy based class of service and adaptive service level management within the context of an

internet and intranet. Mangipudi describes a technology which facilitates categorization and routing of Web traffic based on Class of Service (COS) (*Mangipudi*, Abstract). Mangipudi describes that host computers can be grouped into different clusters (or classes) to facilitate provision of differentiated services. One of these host computers, referred to as the routing host 200, includes a policy engine 210, and is capable of receiving requests from client devices 202 (*Mangipudi*, col. 9 lines 1-6). An incoming request from a client device 202 is received by the routing host 200 which then assigns a class to the request (*Mangipudi*, col. 9 lines 20-25). The policy engine 210 in conjunction with the routing host 200 then distributes the incoming traffic to the most available server 206 for that class (*Mangipudi*, col. 9 lines 20-25).

The Office cites col. 4 lines 28-65 of Mangipudi as teaching "a system of load-balancing which includes nodes and a node manager where the application layer of the servers and their availability are dynamically determined and monitered from a routing host located outside of the cluster." The Office further argues that "the monitoring being performed by the routing host outside of the cluster which is communicatively linked to the node manager in the cluster, such that the monitoring is from a client perspective to detect an error that may impact the application-layer availability as it appears to the routing host from outside of the cluster." The Office compares an intelligent agent of Mangipudi to Applicants' node manager 110, and compares routing host 200 of Mangipudi to Applicants' one or more clients 132-138 (*Office Action,* p. 4-5; *Mangipudi* col. 4 lines 28-65 and Figs. 2-3).

Applicant submits that Mangipudi fails to cure the deficiencies of Gossler. Mangipudi does not describe "dynamically determining present members of a load-balancing cluster which includes nodes and a node manager." Mangipudi describes that an intelligent agent is installed on each back-end server (or node) (*Mangipudi*, col. 4 line 42 and lines 66-67; col. 11 lines 48-50). Contrary to the Office's argument, each Mangipudi server includes its own individual intelligent agent. Mangipudi requires that to communicate with the intelligent agent there must first be communication with the server. Thus, the intelligent agent is not equivalent to a node manager that "serves as the gatekeeper and proxy for the nodes of the cluster" (*Specification*, p. 3 lines. 1-16 and Fig. 1). Accordingly, Mangipudi does not describe "dynamically determining present members of a load-balancing cluster which includes nodes and a node manager."

Applicant further submits that Mangipudi fails to cure the deficiencies of Gossler. Mangipudi also does not describe "monitoring application-layer availability of one or more members of the cluster, the monitoring being performed by one or more clients outside of the cluster which are communicatively linked to the node manager in the cluster, such that the monitoring is from a client perspective to detect an error that may impact the application-layer availability as it appears to the one or more clients from outside of the cluster." Mangipudi describes a routing host configured to receive all clients' requests for sites. Mangipudi also describes that an Adaptive policy engine in communication with the routing host monitors workload and server availability (*Mangipudi*, col. 4 lines 36-45). The routing host must communicate with a separate adaptive policy engine to monitor workload and server availability.

Thus, the routing host is not equivalent to a client. Mangipudi fails to describe "monitoring application-layer availability of one or more members of the cluster, the monitoring being performed by one or more clients outside of the cluster which are communicatively linked to the node manager in the cluster, such that the monitoring is from a client perspective to detect an error that may impact the application-layer availability as it appears to the one or more clients from outside of the cluster."

Applicant also submits that Gossler and/or Mangipudi does not teach or suggest "that the monitoring is from a client perspective to detect an error that may impact the application-layer availability as it appears to the one or more clients from outside of the cluster", as recited in claim 1. There is no discussion in Gossler and/or in Mangipudi that the monitoring (of the application-layer availability) is being performed from a client perspective to detect an error that may impact the application-layer availability as it appears to the one or more clients from outside of the cluster.

Accordingly, claim 1 is allowable over the Gossler and Mangipudi combination for at least the reasons described above, and Applicant respectfully requests that the §103 rejection be withdrawn.

Claims 2-13, 15 and 20 are allowable over the Gossler-Mangipudi combination by virtue of their dependency upon allowable claim 1.

Claims 14 and 16-19 are allowable over the Gossler-Mangipudi combination by virtue of their dependency upon allowable claim 1. Claims 14 and

16-19 are also allowable over the Gossler-Mangipudi-Luzzi combination because Luzzi does not address the deficiencies of the Gossler-Mangipudi combination as described above in response to the rejection of claim 1.

Claim 21 recites a method comprising:

> monitoring application-layer availability of members of a load-balancing cluster which includes nodes and a node manager, the monitoring being performed by one or more clients outside of the cluster which are communicatively linked to the node manager in the cluster, such that the monitoring is from a client perspective to detect an error that may impact the application-layer availability as it appears to the one or more clients from outside of the cluster; and
>
> exoclusterly controlling activity state of the members of the cluster.

Gossler and/or Mangipudi do not teach or suggest the combination of feature(s) recited in claim 21. For example as described above in response to the rejection of claim 1, Gossler and/or Mangipudi do not teach or suggest "monitoring application-layer availability of members of a load-balancing cluster which includes nodes and a node manager, the monitoring being performed by one or more clients outside of the cluster which are communicatively linked to the node manager in the cluster, such that the monitoring is from a client perspective to detect an error that may impact the application-layer availability as it appears to the one or more clients from outside of the cluster" as recited in claim 21. Further, Gossler and/or Mangipudi do not teach or suggest "exoclusterly controlling activity state of the members of the cluster", as recited in claim 21.

Claim 21 has been rejected by the Office for the same reasons as it rejects claims 1-2 above. Applicant submits claim 21 is allowable over the Gossler-

Mangipudi combination for at least the reasons described above in response to the rejection of claims 1-2.

Claims 22-32, 34 and 37 are allowable over the Gossler-Mangipudi combination by virtue of their dependency upon allowable claim 21.

Claims 33 and 35-36 are allowable over the Gossler-Mangipudi combination by virtue of their dependency upon allowable claim 21. Claims 33 and 35-36 are also allowable over the Gossler-Mangipudi-Luzzi combination because Luzzi does not address the deficiencies of the Gossler-Mangipudi combination as described above in response to the rejection of claim 1.

Claims 38 recites a tangible computer-readable medium having computer-executable instructions that, when executed by a computer, perform a method comprising:

> dynamically determining present members of a load-balancing cluster which includes nodes and a node manager and an activity state of each member;
>
> monitoring application-layer availability of the one or more members of the cluster as such availability is observed by the computer outside of the cluster which is communicatively linked to the node manager in the cluster, such that the monitoring is from a client perspective to detect an error that may impact the application-layer availability as it appears to the computer from outside of the cluster; and
>
> exoclusterly controlling the activity state of the members of the cluster.

Gossler and/or Mangipudi do not teach or suggest the combination of feature(s) recited in claim 38. For example as described above in response to the

rejection of claim 1, Gossler and/or Mangipudi do not teach or suggest "dynamically determining present members of a load-balancing cluster which includes nodes and a node manager and an activity state of each member" as recited in claim 38. Further, as described above in response to the rejection of claims 1 and 21, Gossler and/or Mangipudi do not teach or suggest "monitoring application-layer availability of the one or more members of the cluster as such availability is observed by the computer outside of the cluster which is communicatively linked to the node manager in the cluster, such that the monitoring is from a client perspective to detect an error that may impact the application-layer availability as it appears to the computer from outside of the cluster", as recited in claim 38. Still further, as described above in response to the rejection of claim 21, Gossler and/or Mangipudi do not teach or suggest "exoclusterly controlling the activity state of the members of the cluster" as recited in claim 38.

Claim 38 has been rejected by the Office for the same reasons as it rejects claims 1-2 and 10 above. Applicant submits that claim 38 is allowable over the Gossler-Mangipudi combination for at least the reasons described above in response to the rejection of claims 1-2 and 10.

Claim 39 recites a system comprising:

> a dynamic cluster-membership determiner configured to exoclusterly and dynamically determine present members of a load-balancing cluster which includes nodes and a node manager; and
>
> an exocluster monitor configured to monitor application-layer availability of the present members of the cluster, the exocluster monitor distributed across one or more clients outside of the cluster which are communicatively linked to the node manager in the cluster, such that monitoring is from a client perspective to detect an error that may impact the application-layer availability as it appears to the one or more clients from outside of the cluster.

Gossler and/or Mangipudi do not teach or suggest the combination of feature(s) recited in claim 39. For example as described above in response to the rejection of claim 1, Gossler and/or Mangipudi do not teach or suggest "a dynamic cluster-membership determiner configured to exoclusterly and dynamically determine present members of a load-balancing cluster which includes nodes and a node manager" as recited in claim 39. Further, as described above in response to the rejection of claims 1 and 21, Gossler and/or Mangipudi do not teach or suggest "an exocluster monitor configured to monitor application-layer availability of the present members of the cluster, the exocluster monitor distributed across one or more clients outside of the cluster which are communicatively linked to the node manager in the cluster, such that monitoring is from a client perspective to detect an error that may impact the application-layer availability as it appears to the one or more clients from outside of the cluster", as recited in claim 39.

Claim 39 has been rejected by the Office for the same reasons as it rejects claims 1-2, 4, 7, and 10 above. Applicant submits that claim 39 is allowable over the Gossler-Mangipudi combination for at least the reasons described above in response to the rejection of claims 1-2, 4, 7, and 10.

Claims 40-43 are allowable over the Gossler-Mangipudi combination by virtue of their dependency upon allowable claim 39.

Claims 44-45 are allowable over the Gossler-Mangipudi combination by virtue of their dependency upon allowable claim 39. Claims 44-45 are also allowable over the Gossler-Mangipudi-Luzzi combination because Luzzi does not address the deficiencies of the Gossler-Mangipudi combination as described above in response to the rejection of claim 39.

Claim 46 recites a system comprising:

> an exocluster monitor configured to monitor application-layer availability of members of a load-balancing cluster which includes nodes and a node manager, the exocluster monitor distributed across one or more clients outside of the cluster which are communicatively linked to the node manager in the cluster, such that monitoring is from a client perspective to detect an error that may impact the application-layer availability as it appears to the one or more clients from outside of the cluster; and
>
> an exocluster controller configured to control an activity state of members of the cluster.

Gossler and/or Mangipudi do not teach or suggest the combination of feature(s) recited in claim 46. For example as described above in response to the rejection of claim 1, Gossler and/or Mangipudi do not teach or suggest "an exocluster monitor configured to monitor application-layer availability of members of a load-balancing cluster which includes nodes and a node manager, the exocluster monitor distributed across one or more clients outside of the cluster which are communicatively linked to the node manager in the cluster, such that

monitoring is from a client perspective to detect an error that may impact the application-layer availability as it appears to the one or more clients from outside of the cluster" as recited in claim 46. Further, as described above in response to the rejection of claim 21, Gossler and/or Mangipudi do not teach or suggest "an exocluster controller configured to control an activity state of members of the cluster", as recited in claim 46.

Claim 46 has been rejected by the Office for the same reasons as it rejects claims 1, 3-4, 6-7 and 10 above. Applicant submits that claim 46 is allowable over the Gossler-Mangipudi combination for at least the reasons described above in response to the rejection of claims 1, 3-4, 6-7 and 10.

Claims 47-51 are allowable over the Gossler-Mangipudi combination by virtue of their dependency upon allowable claim 46.

Claims 52-53 are allowable over the Gossler-Mangipudi combination by virtue of their dependency upon allowable claim 46. Claims 52-53 are also allowable over the Gossler-Mangipudi-Luzzi combination because Luzzi does not address the deficiencies of the Gossler-Mangipudi combination as described above in response to the rejection of claim 46.

Claim 54 recites a dynamic, active, exocluster monitoring system for monitoring application-layer availability of members of a load-balancing cluster and for controlling an activity state of such members, the monitoring system comprising:

> cluster which includes nodes and a node manager, the app-monitor distributed across one or more clients outside of the cluster which are communicatively linked to the node manager in the cluster, such that monitoring is from a client perspective to detect an error that may impact the application-layer availability as it appears to the one or more clients from outside of the cluster;
>
> a cluster-control configured to exoclusterly determine the activity state of the members of the cluster and to exoclusterly control the activity state of the members of the cluster; and
>
> a central controller configured to coordinate and control the app-monitor and the cluster-control.

Gossler and/or Mangipudi do not teach or suggest the combination of feature(s) recited in claim 54. For example as described above in response to the rejection of claim 1, Gossler and/or Mangipudi do not teach or suggest "cluster which includes nodes and a node manager, the app-monitor distributed across one or more clients outside of the cluster which are communicatively linked to the node manager in the cluster, such that monitoring is from a client perspective to detect an error that may impact the application-layer availability as it appears to the one or more clients from outside of the cluster" as recited in claim 54. Further, as described above in response to the rejection of claim 21, Gossler and/or Mangipudi do not teach or suggest "a cluster-control configured to exoclusterly determine the activity state of the members of the cluster and to exoclusterly control the activity state of the members of the cluster", as recited in claim 54. Still further, Gossler and/or Mangipudi do not teach or suggest "a central

controller configured to coordinate and control the app-monitor and the cluster-control", as recited in claim 54.

Claim 54 has been rejected by the Office for the same reasons as it rejects claims 1-2 and 10 above. Applicant submits that claim 54 is allowable over the Gossler-Mangipudi combination for at least the reasons described above in response to the rejection of claims 1-2 and 10.

Claims 55-57 are allowable over the Gossler-Mangipudi combination by virtue of their dependency upon allowable claim 54. Claims 55-57 are also allowable over the Gossler-Mangipudi-Luzzi combination because Luzzi does not address the deficiencies of the Gossler-Mangipudi combination as described above in response to the rejection of claim 54.

Conclusion

Pending claims 1-57 are in condition for allowance and Applicant respectfully requests issuance of the subject application. If any issues remain that preclude issuance of the application, the Examiner is urged to contact the undersigned attorney before issuing a subsequent Action.

Respectfully Submitted,

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